Manufacturing The Future of Communications™

InterDigital®

InterDigital Communications Corporation
2200 Renaissance Boulevard/Suite 105
P.O. Box 61546
King of Prussia, PA 19406-0946
TEL: (610) 278-7800
FAX: (610) 278-6801
TELEX: 496 16 278 IDC PHA

DOCKET FILE COPY ORIGINAL

January 5, 1995

Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, N.W., Room 222
Washington, DC 20554

Re: InterDigital Communications Corporation
Reply Comments in ET Docket No. 94-32

Dear Mr. Caton:

Transmitted herewith are an original and five (5) copies of the reply comments of InterDigital Communications Corporation in the above referenced proceeding.

Please direct any inquiries regarding this matter to the undersigned.

Sincerely,

Brian G. Kiernan
Vice President

BGK/ram
Enclosures

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Allocation of Spectrum Below 3 GHz Transferred from Federal Government Use	)	ET Docket No. 94-32
	)	
	)	

TO The Commission

REPLY COMMENTS OF
INTERDIGITAL COMMUNICATIONS CORPORATION

InterDigital Communications Corporation ("InterDigital") respectfully submits its reply comments on the Commission's Notice of Proposed Rulemaking to reallocate 50 MHz of spectrum in the bands 2390-2400 MHz, 2402-2417 MHz, and 4660-4685 MHz from Federal Government use to private sector use.[1] InterDigital supports the allocation of the 2390-2400 MHz band, paired with the 2300-2310 MHz band for wireless local loop applications. We believe that these frequencies could be used in rural areas to lower the cost of basic telephone service with radio-based local loops.

---

1. See Notice of Proposed Rulemaking, Allocation of Spectrum Below 5 GHz Transferred From Government Use, ET Docket 94-32, FCC 94-272 (released Nov.8, 1994) ("Notice").

The Commission, in 1988, established the Basic Exchange Telecommunications Radio Service (BETRS). At that time, they made the public interest determination that radio in the local loop is in the public interest. Unfortunately, the Commission did not assign sufficient spectrum to permit the service to fully develop.[2] In this proceeding, the Commission is in a position to correct that omission.

I. INTRODUCTION AND INTEREST OF INTERDIGITAL

InterDigital is a wireless technology manufacturer that has developed an advanced, spectrum efficient digital radio system currently in use providing wireless loops between telephone central offices and customer premises. The system, called the Ultraphone, is based on digital Time Division Multiple Access (TDMA) techniques which allow multiple users simultaneously to share a single radio channel.

The service is provided by local exchange carriers (LECs) under the Commission's Basic Exchange Telecommunications Radio Service (BETRS) rules[3] governing radio in the local loop.

---

2. BETRS was established in 1988. There was considerable concern during the comment period leading up to the ruling (and subsequently in several petitions for reconsideration) over the future of the service if inadequate spectrum was assigned. During the Commission meeting that approved BETRS, several Commissioners noted that if the assigned spectrum proves to be inadequate, that the petitioner should come back to the Commission for more spectrum.

3. 47 C.F.R. Sec. 22.600.

BETRS is provided primarily in rural areas. In these areas, favorable radio versus wire economics encourage the use of radio. BETRS is not normally deployed in urban areas because of the scarcity of spectrum and the more favorable wire versus radio economics in dense urban environments.

The scarcity of spectrum has impaired the growth of BETRS even in rural areas. The competition for the few channels available[4] is intense and there are dozens of documented cases where basic telephone service has been denied due to lack of available BETRS channels.

The competition for the 26 available channels for BETRS was made more acute by Commission action to open up these valuable 450 MHz channels to pagers **even in rural areas**. This action[5] has led to increased licensing of high-powered paging systems which reduce the number and usability of the 450 MHz band channels for BETRS.

This lack of spectrum prompted the original petitioners for BETRS to again petition the Commission for

---

4. See, Report and Order, CC Docket No. 86-495, 3 FCC Rcd 214 (1988); Memorandum Opinion and Order on Reconsideration, CC Docket No. 86-495, 4 FCC Rcd 5017 (1089). The Commission authorized co-primary sharing of the 150 MHz and 450 MHz bands with Public Land Mobile Service and co-primary access to 50 channels in the 800 MHz SMR band. In effect, the 150 and 800 Mhz bands are unusable for a variety of reasons, primarily due to restrictions on the 800 MHz band and full use of the 150 MHz band. That leaves the 26 channels at 450 MHz, which are currently shared with pagers, as the only available BETRS spectrum.

5. See, Flexible allocation of frequencies in the Domestic Land Mobile Services for paging and other services., 52 Fed Reg. 19741 (May 27, 1987).

additional BETRS spectrum[6] In this Petition, which is still pending at the Commission, the petitioners[7] made their case for access to additional spectrum. In the Petition, they demonstrated that available spectrum was inadequate to provide BETRS.

> We have listed some specific examples of spectrum shortage limiting service provision. We have also noted some examples of planned systems which were aborted due to the lack of frequencies. What we have not listed nor are we able to list are the hundreds of opportunities to use radio as a more cost effective media for providing dial tone that were not taken to even the planning stage. This is so because of the fact that growth beyond the initial installation was impossible without adequate spectrum. This last category, adequate spectrum for future growth, represents the major obstacle to the use of radio in the rural local loop. [8]

The public interest determination in favor of BETRS was made at the time BETRS was authorized. The lack of current spectrum is choking off the future use of the BETRS to provide low cost basic telephone service to rural areas of America. An allocation in this proceeding could provide enormous benefits in upgrading basic telephone service in rural America.

II. DISCUSSION

Although the Notice identifies three bands of spectrum for early allocation, InterDigital will confine its comments to the 2390-2400 MHz block as well as the proposal to pair this with the

---

6. See, Petition to Authorize Co-Primary Sharing of the 450 MHz Air-Ground Radiotelephone Service with BETRS (RM-8159), filed November 8, 1992. ("Petition")

7. The petitioners were: The U.S. Telephone Association, The National Telephone Cooperative Association, Organization for the Protection and Advancement of Small Telephone Companies, the National Rural Telecom Association and the Rural Electrification Administration.

8. See, Petition at 9.

2300-2310 MHz block. As noted[9], the 2300-2310 MHz block could be added to the 2390-2400 MHz block to provide a paired allocation for use as a wireless local loop.

In addition to wireless local loop service, there are other competing uses for the spectrum in question: Data PCS and a multi-channel broadband audio and video programming service ("AAVS"). However, both of these uses pale before the public interest involved in providing "state of the art" digital radio technology to lower the cost and improve the quality of telephone services available to the rural telephone customer.

A. RADIO IN THE LOOP CAN MAKE A SIGNIFICANT CONTRIBUTION TO UPGRADING RURAL TELECOMMUNICATIONS.

Much has been said about the "haves and have nots" in the current telecommunications revolution. The record is clear that the rural customers fall into the latter category. InterDigital's experience in rural areas indicates that frequently there is a "second class" mentality as pertains to investment in these areas. Poor outside plant facilities are not uncommon.

The advances made by rural telephone companies tend to focus on the more concentrated areas while the remote areas continue to suffer for the simple economic reason that it's too expensive to run miles and miles of copper wire to reach some distant customers. Radio changes the economic equation because radio is distance insensitive. Its costs do not rise with distance and therefore, it is an ideal solution to upgrading the rural loop.

---

9. See, e.g., Southwestern Bell at 2; USTA at 1, TDS at 1, Rochester Tel at 1.

The Commission understood this when it established BETRS, however, it was unsure of how much spectrum was needed. During the BETRS hearing, the Commission announced publicly that if the spectrum allocated proved insufficient, that the Commission would revisit the allocation. The record is clear, the allocation was insufficient and the allocation needs revisiting.

B. OTHER USES FOR THE SPECTRUM ARE SPECULATIVE, SERVE A SMALL, ELITE SECTOR AND OTHER SPECTRUM OPTIONS ARE AVAILABLE.

As to the competing services for the 2390 MHz block, the record is equally clear. Data PCS already has spectrum allocated to it in the unlicensed PCS blocks, and has available the Part 15 blocks and commercially available spectrum like ARDIS. Data PCS proponents are asking for more spectrum at 2390 to provide "...a transition path, in which immediate demand for nomadic devices can be met in the 2390-2400 MHz band, while the 1910-1920 MHz band can be used in the longer term for nomadic devices..."[10] Data PCS already has a 10 MHz allocation. It also has direct access to over 83 MHz in the Part 15 2400 MHz band. And it could use commercially available spectrum to provide ubiquitous wireless access for the Data PCS devices.

In fact, the 2400-2483.5 MHz Part 15 band could be used immediately for nomadic devices. Many parts of this 83.5 MHz band are sparsely occupied and a 10 MHz block for Data PCS could easily be identified and used.

---

10. See, Comments of Apple at 7.

Moreover, the Part 15 industry has already proven that new innovative wireless devices and services (nomadic as well as non-nomadic) can be developed and successfully marketed in the three Part 15 bands. With such access to spectrum, the Data PCS community should be required to first prove demand for their products in the available unlicensed PCS and Part 15 bands.

Further, the Data PCS marketplace is uncertain. Data PCS is in its infancy and the true demand for nomadic Data PCS may not be known until trial applications are conducted in available spectrum. The recently assigned narrowband PCS spectrum as well as the soon to be commercialized low earth orbiting satellites may well be an appropriate proving ground for Data PCS.

There seems to be no good reason why Data PCS could not initially use available spectrum like the the 83.5 MHz available in the 2400-2483.5 MHz ISM band for unlicensed Part 15 devices or commercially available spectrum like ARDIS. If the demand is there, they could "transition" to a permanent allocation at an appropriate time in the future.

Under no conditions should the speculative Data PCS market be given priority rights to additional spectrum prior to even using the spectrum they already have available. In contrast to Data PCS, the need for an allocation to wireless local loop is compelling.

The AAVS, as proposed by In-Flight Phone Corporation ("In-Flight"), for airline passengers suffers from shortcomings similar to Data PCS. The market for the service is unknown, and spectrum already exists. The target market for AAVS is the flying public, a small and elite marketplace. Moreover, a two year trial of the

marketability of in-flight audio service ended on December 23, 1994. The Gannett-backed Sky Radio ceased operation because, according to news accounts, of poor advertising sales. A representative of Gannett said "Sufficient advertising revenue didn't materialize in the years we were doing Sky Radio, even though we had several approaches in our sales efforts."[11]

It makes no sense to allocate spectrum to two providers of AAVS, as proposed by In-Flight,[12] if a monopolist (Gannet) couldn't make an audio service succeed.

In addition, similar to the spectrum alternatives available to Data PCS, AAVS could be delivered by many of the satellite systems currently available.

The award of spectrum with no assurance of marketplace demand would be the worst kind of speculative "Field of Dreams" allocation the Commission could make.

Identifying what is actually in the public interest is often a difficult undertaking. In this case it's easy. AAVS has at best a limited market in which a recent deep pocket investor failed and in which alternate spectrum (satellite-based) exists to deliver the service. There is no public interest benefit in AAVS that would outweigh the greater benefit of improving the delivery of basic telephone service to rural America.

---

11. See, comments of In-Flight Phone Corporation at attachment 2.

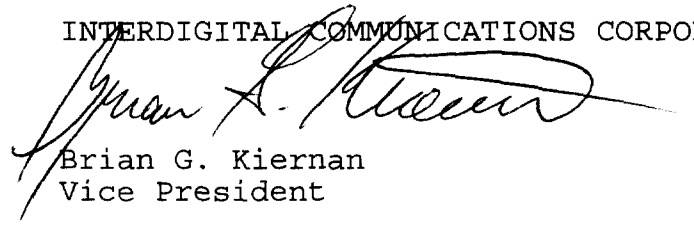
12. Id., at 19.

III. CONCLUSION

The market demand for wireless local loop service has been established. The public interest determination has already been made. The allocation is available. We urge the Commission to move rapidly to allocate the 2300-2310 and 2390-2400 MHz band for wireless local loop service.

Respectfully submitted,

INTERDIGITAL COMMUNICATIONS CORPORATION



Brian G. Kiernan
Vice President

InterDigital Communications Corp.
2200 Renaissance Blvd., Ste. 150
King of Prussia, PA. 19040
(215) 278-7800

January 5, 1994

CERTIFICATE OF SERVICE

I, Rebecca A. McClune, hereby certify that a copy of the foregoing Comments of InterDigital Communications Corp. was mailed first-class, United States mail, postage prepaid, this 5th day of January, 1995, to the parties listed on the attached service list.

Rebecca A. McClune

SERVICE LIST

Part 15 Coalition
c/o Henry Goldberg
Goldberg, Godles, Weiner & Wright
1229 - 19th Street, N.W.
Washington, DC 20036

Apple Computer
c/o Henry Goldberg
Goldberg, Godles, Weiner & Wright
1229 - 19th Street, N.W.
Washington, DC 20036

International Business Machines
c/o William R. Richardson
Wilmer, Cutler & Pickering
2445 M Street, N.W.
Washington, DC 20037

Western States VHF - Microwave Society
c/o E.R. Angle
P.O. Box 35
Lomita, CA 90717-0035

San Bernardino Microwave Society
c/o Bill Burns
247 Rebel Road
Ridgecrest CA 93555

Western Multiplex Corporation
c/o Graham R. Barnes
300 Harbor Blvd.
Belmont CA 94002

Northern Amateur Relay Council of California
c/o Carl Guastaferro
P.O. Box 60531
Sunnyvale, CA 94088-0531

Association of Public Safety Communications Officers
c/o Robert M. Gurss
Wilkes, Artis, Hedrick & Lane, Chartered
1666 K Street, N.W., Suite 1100
Washington, DC 20006

Los Angeles County Sheriff
c/o Robert M. Gurss
Wilkes, Artis, Hedrick & Lane, Chartered
1666 K Street, N.W., Suite 1100
Washington, DC 20006

Ronald J. Krotoszynski
Covington & Burlington
Association for Maximum Service Television, Inc.
1201 Pennsylvania Avenue, N.W.
P.O. Box 7566
Washington, DC 20044

Ernest A. Gleit
AT&T
295 North Maple Avenue, Room 3261B3
Basking Ridge, NJ 07920

Bruce Alberts
National Academy of Sciences
2101 Constitution Avenue
Washington, DC 20418

M. Robin Critchell
SCRRBB
P.O. Box 5967
Pasadena, CA 91117

Michael D. Kennedy
Motorola, Inc.
1350 I Street, N.W.
Washington, DC 20005

George M. Kizer
Telecommunications Indust. Assoc.
2001 Pennsylvania Avenue, N.W., Suite 800
Washington, DC 20006

Caressa D. Bennet
Leaco Rural Telephone Cooperative
2120 L Street, N.W.
Suite 810
Washington, DC 20037

Wayne V. Black
Keller & Heckman
SR Telecom Inc.
1001 G Street, N.W.
Washington, DC 20001

Robert J. Miller
Gardere & Wynne, L.L.P
Alcatel Network Systems
1601 Elm Street, Suite 3000
Dallas, TX 75201

Henrietta Wright
Goldberg, Godles, Weiner & Wright
1229 - 19th Street, N.W.
Washington, DC 20036

Dvora Wolff Rabino
Capital Cities / ABC, Inc.
77 West 66th Street
New York, NY 10023

Rodney L. Joyce
Ginsburg, Feldman & Bress
In-Flight Phone Corporation
1146 19th Street, N.W.
Suite 200
Washington, DC 20036

Leslie A. Taylor
Leslie Taylor Associates
Loral / Qualcomm Partnership
1001 Pennsylvania Avenue, N.W.
Washington, DC 20004-2505

Jeffrey L. Sheldon
Utilities Telecommunications Council
1440 Connecticut Avenue, N.W.
Suite 1140
Washington, DC 20036

Christopher D. Imlay
Booth, Freret & Imlay
American Radio Relay League
1233 - 20th Street, N.W.
Suite 204
Washington, DC 20036

Henry M. Rivera
Ginsburg, Feldman & Bress, Chtd.
Metricom, Inc.
1250 Connecticut Avenue, N.W.
Washington, DC 20036

James F. Lovette
Apple Computer Inc.
One Infinite Loop - MS 301-45
Cupertino, CA 95014

Mitchell Lazarus
Symbol Technologies, Inc.
c/o Arent Fox Kintner Plotkin
1101 South Winchester Blvd.
Suite B-110
San Jose, CA 95128

Wayne V. Black
American Petroleum Institute
c/o Keller & Heckman
1001 G Street, N.W.
Washington, DC 20001

Willem A. Bann
Cornell University and the National Astronomy
and Ionosphere Center
Arecibo Observatory
P.O. Box 995
Arecibo, Puerto Rico 00613

Amateur Television Network
P.O. Box 1594
Crestline, CA 92325

William A. Tynan
Radio Amateur Satellite Corp.
P.O. Box 27
Washington, DC 20044

Stephen L. Bell
KBTRZ
1702 East Camino Cielo
Tucson, Arizona 85718

Larry Irving
NTIA
Room 4898
Herbert C. Hoover Building
14th & Consitution Avenue, N.W.
Washington, DC 20230

William A. Burns
247 Rebel Road
Ridgecrest, CA 93555

Paul J. Feldman
Fletcher, Heald & Hildreth, P.L.C.
11th Floor, 1300 North 17th Street
Rosslyn, VA 22208

Mitchell Lazarus
Symbol Technologies, Inc.
c/o Arent Fox
1101 South Winchester Blvd.
Suite B-110
San Jose, CA 95128

Robert M. Pepper
Office of Plans & Policy
FCC
1919 M Street
Washington, DC 20054

Steve Sharkey
Office of Entineering TEC
FCC
2025 M Street
Room 5202
Washington, DC 20554

Stuart E. Overby
Motorola
1350 I Street, N.W.
Washington, DC 20005

Shirley S. Fujimoto
Western Multiplex Corp.
c/o Keller & Heckman
300 Harbor Boulevard
Belmont, CA 94002

Carole C. Harris
Southern Company
c/o Keller & Heckman
1001 G Street, N.W.
Suite 500 West
Washington, DC 20001